Deepak Maram

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Research

I am broadly interested in computer security, privacy, and applied cryptography. My recent focus has largely been around decentralized systems like blockchains. My research has led to direct industry adoption. CHURP [CCS19] is on Oasis Labs product road map. DECO [CCS20] is licensed from Cornell by Chainlink.

Education

2018-present **Ph.D. in Computer Science**.
Cornell Tech, New York, USA
Advisor: *Prof. Ari Juels*, GPA: 3.71/4

2012-16 **B.Tech in Computer Science with Honors**.
Indian Institute of Technology, Bombay, India
GPA: 8.91/10

Publications

[SP21] **CanDID: Can-Do Decentralized Identity with Legacy Compatibility, Sybil-Resistance, and Accountability**.
D. Maram, H. Malvai, F. Zhang, N. Jean-Louis, A. Frolov, T. Kell, T. Lobban, C. Moy, A. Juels, and A. Miller. *In IEEE S&P 2021. To appear.*

[CCS20] **DECO: Liberating Web Data Using Decentralized Oracles**, *deco.works*.
F. Zhang, **D. Maram**, H. Malvai, S. Goldfeder, and A. Juels. *In ACM CCS 2020. To appear.*

[CCS19] **CHURP: Dynamic-committee Proactive Secret Sharing**, *churp.io*.
D. Maram, F. Zhang, L. Wang, A. Low, Y. Zhang, A. Juels, and D. Song. *In Proceedings of the 2019 ACM Conference on Computer and Communications Security (CCS).*

[SIGMOD19] **SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning**.
I. Trummer, S. Moseley, **D. Maram**, S. Jo, and A. Antonakakis. *In Proceedings of the 2019 International Conference on Management of Data (SIGMOD).*

[SEFM16] **Incentive Stackelberg Mean-payoff Games**.
A. Gupta, S. Schewe, A. Trivedi, **D. Maram**, P. Bharath Kumar. *In Proceedings of the 2016 Conference on Software Engineering and Formal Methods (SEFM).*

Industry Experience

May 2020-present **Cryptography Research Engineer Internship**, *Cloudflare*, Remote.
Design and development of cryptographic alternatives to CAPTCHAs with special emphasis on usability, privacy.

2016-17 **Member of Technical Staff**, *Oracle*, Bangalore.

Summer 2014 **Software Developer Internship**, *Housing.com*, Mumbai.

Honors / Awards

2018 Awarded University Fellowship by Cornell

2012 Secured All India Rank 12 in *IIT-JEE* out of 500,000 students

2012 Secured All India Rank 36 in *AIEEE* out of 1,100,000 students

2012 Recipient of KVPY scholarship and attended VIJYOSHI Camp

2011 Awarded merit certificate for being in top 1% in National Standard Examination - Astronomy

Posters / Talks

2020 **CanDID: A Decentralized Identity System**.
Presented our work at the Hyperledger Identity WG.

2019 **CHURP: Dynamic-committee Proactive Secret Sharing**.
Presented our work at the ACM conference on Computer and Communication Security (CCS), London.
Gave a talk at the Initiative for Cryptocurrencies and Contracts (IC3) Winter Retreat, Interlaken.

2018 **SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning**.
Presented a poster at the Conference on Very Large Data Bases (VLDB) 2018, Rio.

2015 **DoS attacks on SCION and SCION Discrete Event Simulator**.
Gave a talk at the end of my research internship at ETH Zurich.

2014 **Algorithms for solving Parity Games**.
Gave a talk at the end of my R&D project at IIT Bombay.

Teaching Experience

2016 **Teaching Assistant**, *IIT Bombay*, CS101: Computer Programming.

2015 **Undergraduate Tutor**, *IIT Bombay*, Data Structures and Algorithms.

Graduate-level Course Work

Advanced Programming Languages, Advanced Operating Systems, Intro to Computer Vision, Security & Privacy Technologies, Cryptocurrency and Smart Contracts, Advances in Intelligent and Learning Agents (UG), Advanced Cryptography (UG), Computational Ring Theory (UG), Graph Theory (UG)

Selected Undergraduate Projects

2016 **Intelligent agents for Arcade Learning Environment**, *IIT Bombay*.
Class Project, *Guide: Prof. Shivaram Kalyanakrishnan*

2015 **Discovering network attacks on SCION**, *ETH Zurich*.
Research Internship, *Guide: Prof. Adrian Perrig*

2015 **Experiments with wireless bit-rate adaptation**, *IIT Bombay*.
R&D Project, *Guide: Prof. Mythili Vutkuru*

2015 **Building a compiler from scratch**, *IIT Bombay*.
Class Project, *Guide: Prof. Amitabha Sanyal*

2014 **Designing a 4-Stroke Radial Engine in Box2D**, *IIT Bombay*.
Class Project, *Guide: Prof. Parag Chaudhuri*

2013 **Building Tetris in a functional language**, *IIT Bombay*.
Class Project, *Guide: Prof. Amitabha Sanyal*

Media Coverage

Aug 29, 2020 *Forbes*, "Chainlinks New Acquisition From Cornell University Could Transform Blockchain For Good".

Aug 29, 2020 *CoinDesk*, "Chainlink Acquires Blockchain Oracle Solution From Cornell University".

Aug 29, 2020 *CoinTelegraph*, "Chainlink acquires a privacy-preserving oracle protocol from Cornell University".

Aug 29, 2020 *PR Newswire*, "Chainlink Acquires DECO from Cornell University".

Mar 30, 2019 *MIT Tech Review China*, "The whereabouts of 4 million bitcoins worldwide are missing".

Service / Extra-curriculars

2019 Served as the treasurer of PhD student organization At Cornell Tech (PACT)

2019 Co-organizer of Computer Science Admitted PhD Student Visit Day

2019 Co-organizer of Cornell Tech Security Seminar

2016 Worked as a member of *Insight*, the IIT-Bombay newsletter, and contributed several articles for the same

2014 Awared first prize at the *XLR8* competition for designing a Wireless Controlled Bot

2003-07 Won first prize in multiple district-level chess tournaments in Under-8, Under-10 and Under-12 categories